

Supplementary Table 1. Published crossdated marine sclerochronologies. Datasets for which there is replication (generally n>5) and at least some mention of crossdressing patterns among samples.

Type	Species	Region	Site(s)	Start ^a	n ^b	ISC ^c	Lat ^d	Lon ^d	Citation
Bivalve	<i>Arctica islandica</i>	NE Atlantic	Faeroe Islands	1963-2013	39	0.78	62.0	-6.2	Bonitz, F.G.W. (2018). Links between phytoplankton dynamics and shell growth of <i>Arctica islandica</i> on the Faroe Shelf. <i>Journal of Marine Systems</i> 179: 72-87.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	North Sea Fladen Ground Site A	1870-1979	5	0.57	58.8	-0.3	Butler, P.G. et al. (2009). Accurate increment identification and the spatial extent of the common signal in five <i>Arctica islandica</i> chronologies from the Fladen Ground, northern North Sea. <i>Paleoceanography</i> 24, PA2210, doi:10.1029/2008PA001715.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	North Sea Fladen Ground Site B	1870-1979	5	0.71	59.1	0.2	Butler, P.G. et al. (2009). Accurate increment identification and the spatial extent of the common signal in five <i>Arctica islandica</i> chronologies from the Fladen Ground, northern North Sea. <i>Paleoceanography</i> 24, PA2210, doi:10.1029/2008PA001715.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	North Sea Fladen Ground Site C	1870-1979	5	0.76	59.4	0.5	Butler, P.G. et al. (2009). Accurate increment identification and the spatial extent of the common signal in five <i>Arctica islandica</i> chronologies from the Fladen Ground, northern North Sea. <i>Paleoceanography</i> 24, PA2210, doi:10.1029/2008PA001715.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	North Sea Fladen Ground Site F5	1870-1979	5	0.76	59.4	0.5	Butler, P.G. et al. (2009). Accurate increment identification and the spatial extent of the common signal in five <i>Arctica islandica</i> chronologies from the Fladen Ground, northern North Sea. <i>Paleoceanography</i> 24, PA2210, doi:10.1029/2008PA001715.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	Man Island, Irish Sea	1860-2004	32	0.45	59.0	-4.0	Bonitz, F.G.W. et al. (2019). Continuous marine carbon reservoir calibration and the 13C Suess effect in the Irish Sea: Results from the multi-centennial shell-based marine master chronology. <i>Earth and Planetary Science Letters</i> 279:230-241.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	N Iceland Shells	1865-2015	60	0.59	61.0	-16.0	Chikaraishi, Y. et al. (2003). Climate variability of marine shells from the North Sea in a 130-year-old dataset. <i>Paleoceanography</i> .
Bivalve	<i>Arctica islandica</i>	NW Atlantic	Gulf of Maine, Innisport	1954-2006	11	0.70	43.7	-68.6	Goffin, S.M. (2012). Applying dendrochronology visual crossdating techniques to boreal marine bivalve <i>Arctica islandica</i> and assessing the utility of master growth chronologies as proxies for temperature and secondary productivity in the Gulf of Maine. <i>MS Thesis, Geological and Atmospheric Sciences, Iowa State University, Ames, IA</i> , 237pp.
Bivalve	<i>Arctica islandica</i>	NW Atlantic	Gulf of Maine, Seigan Island	1761-2013	6.0	0.64	48.7	-6.8	Griffin, S.M. (2012). Applying dendrochronology visual crossdating techniques to boreal marine bivalve <i>Arctica islandica</i> and assessing the utility of master growth chronologies as proxies for temperature and secondary productivity in the Gulf of Maine. <i>MS Thesis, Geological and Atmospheric Sciences, Iowa State University, Ames, IA</i> , 237pp.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	North Sea	1040-2010	51	0.57	57.0	-2.0	Holland, H.A. et al. (2014). Decadal climate variability of the North Sea during the last millennium reconstructed from bivalve shells (<i>Arctica islandica</i>). <i>The Holocene</i> 24:771-786.
Bivalve	<i>Arctica islandica</i>	NE Atlantic	North Sea	1043-2012	51	0.57	57.0	-2.0	Holland, H.A. et al. (2014). Decadal climate variability of the North Sea during the last millennium reconstructed from bivalve shells (<i>Arctica islandica</i>). <i>The Holocene</i> 24:771-786.
Bivalve	<i>Arctica islandica</i>	N I / E Iceland	1763-2003	10	0.60	14.0	14.0	14.0	Chikaraishi, G. et al. (2012). Climate signal detection in bivalve shells (<i>Arctica islandica</i>) from the Fladen Ground, northern North Sea. <i>Paleoceanography</i> 24, PA2210, doi:10.1029/2008PA001715.
Bivalve	<i>Arctica islandica</i>	NE Icelandic	1835-2012	16	0.60	54.0	0.0	0.0	Marshall, S. and Schone, B.R. (2013). Oceanographic control on shell growth of <i>Arctica islandica</i> (<i>Bivalvia</i>) in surface waters of Northeast Iceland – implications for paleoceanographic reconstructions. <i>Paleoceanography</i> , <i>Palaoclimatology</i> , <i>Paleaeocology</i> 37:152-162.
Bivalve	<i>Arctica islandica</i>	NE Icelandic	1837-2010	4	0.60	54.0	0.0	0.0	Marshall, S. et al. (2017). Biatalia ratios in shells of <i>Arctica islandica</i> – Potential environmental proxy and crossdating tool. <i>Paleoceanography</i> , <i>Palaoclimatology</i> , <i>Paleaeocology</i> 37:152-162.
Bivalve	<i>Arctica islandica</i>	NE Icelandic	1837-2011	5	0.60	54.0	0.0	0.0	Marshall, S. et al. (2017). Biatalia ratios in shells of <i>Arctica islandica</i> – Potential environmental proxy and crossdating tool. <i>Paleoceanography</i> , <i>Palaoclimatology</i> , <i>Paleaeocology</i> 37:152-162.
Bivalve	<i>Arctica islandica</i>	NW Atlantic	George's Bank, Gulf of Maine	1954-1994	10	0.47	47.0	-67.0	Morlito, T. et al. (2000). Precise temporal correlation of Holocene mollusk shells using sclerochronology. <i>Quaternary Research</i> 53:236-248.
Bivalve	<i>Arctica islandica</i>	North Atlantic	George's Bank, Gulf of Maine	1965-1994	7	0.52	47.0	-67.0	Morlito, T. et al. (2000). Precise temporal correlation of Holocene mollusk shells using sclerochronology. <i>Quaternary Research</i> 53:236-248.
Bivalve	<i>Arctica islandica</i>	North Atlantic	Ingey, Northern Norway	1960-2012	8	0.58	71.1	24.1	Mettler, M.J. et al. (2016). Linking large-scale climatic variability with <i>Arctica islandica</i> shell growth and geochemistry in northern Norway. <i>Limnology and Oceanography</i> , 61:748-764.
Bivalve	<i>Arctica islandica</i>	North Sea	Isle of Man	1887-2013	21	0.47	54.7	-4.5	Monks, J. et al. (2018). Climate signals in biological master chronologies derived from shells of the British Isles. <i>Palaeoceanography</i> 33:104.
Bivalve	<i>Arctica islandica</i>	North Sea	Isle of Man	1886-2002	12	0.60	49.0	-4.0	Schone, B.R. et al. (2003). The conucoidea of chily winters: ocean quahog (<i>Arcilla islandica</i> , L. Molusca) master chronology reveals both water nutrient enrichment during colder winters (North Sea). <i>Journal of the Malacological Association of the United Kingdom</i> 77:801-816.
Bivalve	<i>Arctica islandica</i>	North Sea	Doger bank	1953-1995	10	0.60	56.0	0.0	Wiltshire, R. (1997). A long-term growth record derived from <i>Arctica islandica</i> (Gmelin, 1791) shells found on the Fladen Ground (northern North Sea). <i>The Holocene</i> 17:359-49.
Bivalve	<i>Arctica islandica</i>	Fladen Ground, North Sea	Fladen Ground, North Sea	1893-1991	27	0.60	59.0	-1.0	Wiltshire, R. (1997). A long-term growth record derived from <i>Arctica islandica</i> (Gmelin, 1791) shells found on the Fladen Ground (northern North Sea). <i>The Holocene</i> 17:359-49.
Bivalve	<i>Ciliostoma leptostoma</i>	Scandinavia	Skagerrak/Barents Sea	1977-2006	22	0.58	57.8	0.0	Yin, C. et al. (2017). Climatic records in shells of <i>Ciliostoma leptostoma</i> – Potential environmental proxy and crossdating tool. <i>Paleoceanography</i> , <i>Palaoclimatology</i> , <i>Paleaeocology</i> 30:10-20.
Bivalve	<i>Climacocardium columatum</i>	Svalbard/Barents Sea	Barents Sea (Arctic Water)	1966-2007	16	0.75	72.7	23.7	Carroll, M.L. et al. (2014). Biatalia growth rate and isotopic variability across the Barents Sea Polar Front. <i>Journal of Marine Systems</i> 130:167-180.
Bivalve	<i>Climacocardium columatum</i>	Svalbard/Barents Sea	Barents Sea (Polar Front)	1960-2007	19	0.75	73.3	24.4	Carroll, M.L. et al. (2014). Biatalia growth rate and isotopic variability across the Barents Sea Polar Front. <i>Journal of Marine Systems</i> 130:167-180.
Bivalve	<i>Climacocardium columatum</i>	Svalbard/Barents Sea	Barents Sea (Atlantic Water)	1952-2004	10	0.75	73.0	25.1	Carroll, M.L. et al. (2014). Biatalia growth rate and isotopic variability across the Barents Sea Polar Front. <i>Journal of Marine Systems</i> 130:167-180.
Bivalve	<i>Glycymeris glycymeris</i>	Mediterranean Sea	Adriatic Sea, Croatia	1929-2007	9	0.45	45.0	-15.0	Büdel, I. et al. (2015). Glycymeris bimaculata (Poli, 1759) – A new sclerochronological archive for the Mediterranean? <i>Journal of Sea Research</i> 95:139-148.
Bivalve	<i>Glycymeris glycymeris</i>	N Atlantic	Irish Sea	1930-1995	10	0.41	47.4	-1.0	Brockes, W. et al. (2010). The dog codic: <i>Glycymeris glycymeris</i> (L.), a new annually-resolved sclerochronological archive for the Irish Sea. <i>Paleogeography, Paleoclimatology, Palaeoecology</i> 37:133-140.
Bivalve	<i>Glycymeris glycymeris</i>	N Atlantic	Irish Sea	1930-2005	22	0.45	47.4	-1.0	Brockes, W. et al. (2010). The dog codic: <i>Glycymeris glycymeris</i> (L.), a new annually-resolved sclerochronological archive for the Irish Sea. <i>Paleogeography, Paleoclimatology, Palaeoecology</i> 37:133-140.
Bivalve	<i>Glycymeris glycymeris</i>	Mediterranean Sea	Tirrenian Passage, Scotland	1959-2015	68	0.62	13.0	13.7	Pethakis, G. et al. (2018). Using bivalve chronologies for quantifying seasonal growth and environmental change in the northern Mediterranean Sea. <i>Scientific Reports</i> 8:5559. doi:10.1038/s41598-018-23773-x.
Bivalve	<i>Lamelisula elliptica</i>	Southern Ocean	Antarctica, King George Island	1980-2010	17	0.22	-52.8	-58.0	Brey, T. et al. (2018). The Lamelisula elliptica/Lamelisula elliptica biostratigraphic zonation in the Antarctic Peninsula. <i>Journal of Marine Systems</i> 170:225-234.
Bivalve	<i>Merismena merismena</i>	NW Atlantic	Narragansett Bay, RI	1959-1984	100	0.15	71.3	-7.0	Douglas, D.S. et al. (1989). Sclerochronological records of temperature and growth from shells of <i>Merismena merismena</i> from Narragansett Bay, Rhode Island. <i>Marine Biology</i> 102:225-234.
Bivalve	<i>Poppea subtrita</i>	NE Pacific	Bartlett	1937-2003	30	0.65	-16.8	-14.0	MacCullum, S. et al. (2017). Multi-proxy reconstructions of northeast Pacific sea surface temperature from tree rings and Pacific oysters. <i>Paleogeography, Paleoclimatology, Palaeoecology</i> 487:40-47.
Bivalve	<i>Poppea subtrita</i>	NE Pacific	Brady's Beach	1934-2001	30	0.71	48.8	-12.5	Blanchard, B.A. et al. (2009). Multi-proxy reconstructions of northeast Pacific sea surface temperature from tree rings and Pacific oysters. <i>Paleogeography, Paleoclimatology, Palaeoecology</i> 278:40-47.
Bivalve	<i>Poppea subtrita</i>	NE Pacific	Cape Marks	1887-2004	24	0.67	-12.0	-10.0	MacCullum, S. et al. (2017). Multi-proxy reconstructions of northeast Pacific sea surface temperature from tree rings and Pacific oysters. <i>Paleogeography, Paleoclimatology, Palaeoecology</i> 278:40-47.
Bivalve	<i>Poppea subtrita</i>	NE Pacific	Goletts	1889-2002	22	0.67	-14.0	-12.0	MacCullum, S. et al. (2017). Multi-proxy reconstructions of northeast Pacific sea surface temperature from tree rings and Pacific oysters. <i>Paleogeography, Paleoclimatology, Palaeoecology</i> 278:40-47.
Bivalve	<i>Poppea subtrita</i>	NE Pacific	Protection Island	1877-1999	4	0.76	-48.8	-41.0	Strom, A. et al. (2004). A new paleoenvironmental reconstruction. <i>Geophysical Research Letters</i> 31:1940.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Rippledflor, Svalbard	1963-2006	29	0.82	22.3	-23.0	Anderson, W.G. et al. (2006). Growth in a Northern High-Arctic field. Evidence for local- and large-scale climatic forcing. <i>Global Change Biology</i> 12:1595-1607.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Smoothflor, Svalbard	1963-2006	24	0.82	22.4	-23.0	Anderson, W.G. et al. (2006). Growth in a Northern High-Arctic field. Evidence for local- and large-scale climatic forcing. <i>Global Change Biology</i> 12:1595-1607.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Lippedflor, Svalbard	1985-2006	41	0.58	23.7	-17.0	Carroll, M.L. et al. (2011). Pan-Svalbard growth rate variability and environmental regulation in the Arctic bivalve <i>Spisula granularis</i> . <i>Journal of Marine Systems</i> 88:239-251.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Forleashedlund, Svalbard	1998-2007	40	0.58	23.8	-11.0	Carroll, M.L. et al. (2011). Pan-Svalbard growth rate variability and environmental regulation in the Arctic bivalve <i>Spisula granularis</i> . <i>Journal of Marine Systems</i> 88:239-251.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Kongsfjorden, Svalbard	1997-2008	80	0.75	23.1	-12.0	Carroll, M.L. et al. (2011). Pan-Svalbard growth rate variability and environmental regulation in the Arctic bivalve <i>Spisula granularis</i> . <i>Journal of Marine Systems</i> 88:239-251.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Svalbard	1997-2006	5	0.75	23.1	-12.0	Carroll, M.L. et al. (2011). Pan-Svalbard growth rate variability and environmental regulation in the Arctic bivalve <i>Spisula granularis</i> . <i>Journal of Marine Systems</i> 88:239-251.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Hornbæk Bank, Barents Sea	1993-2006	21	0.75	26.0	-18.0	Carroll, M.L. et al. (2011). Pan-Svalbard growth rate variability and environmental regulation in the Arctic bivalve <i>Spisula granularis</i> . <i>Journal of Marine Systems</i> 88:239-251.
Bivalve	<i>Spisula granularis</i>	Svalbard/Barents Sea	Barents Sea	1979-2008	13	0.70	26.0	-12.0	Carroll, M.L. et al. (2011). Pan-Svalbard growth rate variability and environmental regulation in the Arctic bivalve <i>Spisula granularis</i> . <i>Journal of Marine Systems</i> 88:239-251.
Bivalve	<i>Yoldia eightsii</i>	Southern Ocean	Antarctica, South Orkney Islands	1968-1988	18	0.67	-45.6	-38.0	Roman-González, A. et al. (2017). A new sclerochronological archive for Antarctic coral water based on the marine bivalve <i>Yoldia eightsii</i> (Jay, 1839) from the South Orkney Islands. <i>The Holocene</i> 27:271-281.
Bivalve	<i>Yoldia eightsii</i>	Southern Ocean	Key Largo	1969-1987	14	0.67	-45.6	-38.0	Hudson, J.H. et al. (2004). Growth in a tropical coral. <i>Montastraea annularis</i> . <i>Geology</i> 31:434-436.
Bivalve	<i>Yoldia eightsii</i>	Southern Ocean	Gulf of Mexico	1968-1978	12	0.76	-23.0	-38.0	Hudson, J.H. et al. (2004). Effects of environmental change on the growth of a tropical reef fish from the Southern Hemisphere: a biocaloritographic approach. <i>Marine Biology</i> 149:162-167.
Bivalve	<i>Yoldia eightsii</i>	Southern Ocean	Florida Keys	1940-1975	7	0.24	-30.0	-60.0	Hudson, J.H. et al. (1984). Environmentally induced growth rate changes in <i>Montastraea annularis</i> coral. <i>Global Change Biology</i> 2:121-127.
Bivalve	<i>Yoldia eightsii</i>	Atlantic	Biscayne Bay	1940-1986	16	0.50	-84.0	-82.0	Hudson, J.H. et al. (1984). Environmentally induced growth rate changes in <i>Montastraea annularis</i> coral. <i>Global Change Biology</i> 2:121-127.
Bivalve	<i>Yoldia eightsii</i>	Atlantic	Turneffe Atoll	1964-2000	6	0.05	-74.4	-87.7	Carroll, M.L. et al. (2011). Pan-Svalbard growth rate variability and environmental regulation in the Arctic bivalve <i>Spisula granularis</i> . <i>Journal of Marine Systems</i> 88:239-251.
Bivalve	<i>Yoldia eightsii</i>	Atlantic	Cayos Cochinos	1968-2005	7	0.53	-86.0	-86.5	Carroll, J.E. et al. (2010). Century-scale records of coral growth rates indicate that local stressors reduce coral thermal tolerance threshold. <i>Global Change Biology</i> 16:1247-1257.
Bivalve	<i>Yoldia eightsii</i>	Atlantic	Sapodilla Cayes	1958-2005	21	0.61	-88.0	-88.0	Carroll, J.E. et al. (2010). Century-scale records of coral growth rates indicate that local stressors reduce coral thermal tolerance threshold. <i>Global Change Biology</i> 16:1247-1257.
Bivalve	<i>Yoldia eightsii</i>	Atlantic	Biscayne Bay	1961-1983	25	0.51	-80.0	-80.0	Carroll, J.E. et al. (2010). Century-scale records of coral growth rates indicate that local stressors reduce coral thermal tolerance threshold. <i>Global Change Biology</i> 16:1247-1257.
Bivalve	<i>Yoldia eightsii</i>	Gulf of Mexico	Great Barrier Reef	1967-2000	4	0.55	-14.0	-14.0	Dungey, S.E.P. et al. (2014). A rapid decrease in coral growth rates on the Great Barrier Reef from 1974 to 2003 CE using coral-in-dwelling sea surface temperature sensors from the coral <i>Siderastrea siderea</i> . <i>Paleoceanography</i> 29:403-422.
Bivalve	<i>Siderastrea siderea</i>	Gulf of Mexico	Gulf of Mexico	1731-2012	11	0.47	-24.8	-28.8	Flannery, J.A. et al. (2017). Multi-specific coral/Si-based sea-surface temperature reconstruction using <i>Obicella favelatae</i> and <i>Siderastrea siderea</i> from the Florida Straits. <i>Paleoceanography, Palaeoclimatology, Palaeoecology</i> 46:100-109.
Fish	<i>Achoerodus gouldii</i>	E Indian Ocean	SW Australia	1962-2007	56	0.11	-34.5	-120.5	Rowley, A.N. et al. (2014). Water temperature and fish growth: evidence of growth rate changes of a marine fish from the Southern Hemisphere: a biocaloritographic approach. <i>Marine Biology</i> 159:1327-1333.
Fish	<i>Achoerodus gouldii</i>	E Indian Ocean	SW Australia	1962-2007	54	0.11	-34.5	-120.5	Rowley, A.N. et al. (2014). Water temperature and fish growth: evidence of growth rate changes of a marine fish from the Southern Hemisphere: a biocaloritographic approach. <i>Marine Biology</i> 159:1327-1333.
Fish	<i>Girella incrustata</i>	New Zealand	New Zealand	1989-2006	32	0.51	-38.5	-17.5	Gillanders, B.A. et al. (2012). Climatic differences in otolith growth in two species of coral reef fishes. <i>Marine Biology</i> 159:1327-1333.
Fish	<i>Hexagrammos decagrammus</i>	NE Pacific	Katmai	1995-2010	6	0.67	59.4	-153.9	Gillanders, B.A. et al. (2012). Climatic differences in otolith growth in two species of coral reef fishes. <i>Marine Biology</i> 159:1327-1333.
Fish	<i>Hexagrammos decagrammus</i>	NE Pacific	Prince William Sound	1995-2010	6	0.67	59.4	-153.9	Gillanders, B.A. et al. (2012). Climatic differences in otolith growth in two species of coral reef fishes. <i>Marine Biology</i> 159:1327-1333.
Fish	<i>Hexagrammos decagrammus</i>	NE Pacific	Elfin Cove	1995-2008	23	0.51	-60.0	-147.0	Gillanders, B.A. et al. (2012). Climatic differences in otolith growth in two species of coral reef fishes. <i>Marine Biology</i> 159:1327-1333.
Fish	<i>Hexagrammos decagrammus</i>	NE Pacific	Elfin Cove	1995-2010	23	0.51	-60.0	-147.0	Gillanders, B.A. et al. (2012). Climatic differences in otolith growth in two species of coral reef fishes. <i>Marine Biology</i> 159:1327-1333.
Fish	<i>Leptosynanceia polylepis</i>	SE Indian Ocean	Gulf of Mexico	1964-2006	47	0.55	-57.0	-163.0	Black, B.A. et al. (2013). Otolith biocaloritographic reveal latitudinal differences in growth of <i>Benema seychellensis</i> (Leptosynanceia polylepis) in the southern Indian Ocean. <i>Marine Ecology Progress Series</i> 468:253-262.
Fish	<i>Limanda sp.</i>	Bering Sea	southeastern Bering Sea	1964-2008	47	0.55	-57.0	-163.0	Black, B.A. et al. (2013). Otolith biocaloritographic reveal latitudinal differences in growth of <i>Benema seychellensis</i> (Leptosynanceia polylepis) in the southern Indian Ocean. <i>Marine Ecology Progress Series</i> 468:253-262.
Fish	<i>Limanda sp.</i>	Bering Sea	southeastern Bering Sea	1964-2008	50	0.55	-57.0	-163.0	Black, B.A. et al. (2013). Otolith biocaloritographic reveal latitudinal differences in growth of <i>Benema seychellensis</i> (Leptosynanceia polylepis) in the southern Indian Ocean. <i>Marine Ecology Progress Series</i> 468:253-262.
Fish	<i>Limanda sp.</i>	Bering Sea	Central Bering Sea	1965-2012	23	0.47	-58.0	-163.0	Black, B.A. et al. (2013). Otolith biocaloritographic reveal latitudinal differences in growth of <i>Benema seychellensis</i> (Leptosynanceia polylepis) in the southern Indian Ocean. <i>Marine Ecology Progress Series</i> 468